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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/631,376	07/30/2003	Eric J. Bergman	54008.8033.US00 P03-0004	2135

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EXAMINER	
EL ARINI, ZEINAB	

ART UNIT	PAPER NUMBER
1746	

DATE MAILED: 10/03/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/631,376	BERGMAN, ERIC J.	
	Examiner	Art Unit	
	Zeinab E. EL-Arini	1746	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 July 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2,7,9,10,12-18,20-24 and 26-41* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,7,9,10,12-18,20-24 and 26-41* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *9/22/05,8/22/05,6/6/05, 5/3/05*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

The amendment and remarks filed 7/11/05 have been acknowledged and entered.

Claims 1-2, 7, 9-10, 12-18, 20-24, and 26-41 are pending.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

1. Claims 33-34 and 37-41 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the

written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The specification, as originally filed, does not provide support for "100 nm/minute" (claim 33), "500 nm/minute" (claim 34), "HF forms hydrofluoric acid" (claim 37), and "with the hydrogen fluoride converting to hydrofluoric acid" in claim 38.

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 40 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 40, line 2, "the ozone" lacks antecedent basis.

The rejection under 35 U.S.C. 103(a) over DeGendt et al. '409 in combination with EP'177 stated in paper No. 041105 has been withdrawn in view of applicant's amendment and remarks.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*,

11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington,* 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1-2, 13-16, 20-22, 24, 26-27, and 29-31 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-2, 5-6, 8-11, 16, 17-19, and 26-27 of copending Application No. 10/917,094. Although the conflicting claims are not identical, they are not

patentably distinct from each other because the process as claimed in both applications is functionally equivalent.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

This rejection stated in paper No. 041105 is maintained.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 19 is rejected under 35 U.S.C. 102(b) as being anticipated by Zazzera et al.

This rejection stated in paper No. 041105 has been withdrawn in view of applicant's amendment (cancellation of claim 19).

> (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

Claims 1-2, 7, 9-10, 12, 29, and 32 are rejected under 35 U.S.C. 102(e) as being anticipated by DeGendt et al. (6,551,409).

DeGendt et al. disclose a method of etching silicon wafer comprising placing the wafer into a process chamber; forming aqueous liquid layer on the surface of the wafer, delivering ozone gas, and delivering HF into the chamber with HF etching the oxidized silicon layer as claimed. The carrier gas is ozone and the HF vapor. The reference discloses the step of removing the etched oxidized silicon from the process chamber via a system exhaust is inherent in the DeGendt et al.

This rejection stated in paper No. 041105 is maintained. This is because the HF can be used for

etching oxide film or removing polymer from the surface of the workpiece.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 13-18, 20-24, and 26-41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Torek et al. (6,758,938) in combination with DeGendt et al. (US 2002/0011257 A1) or EP'177 and Kenny et al. (US2004/0103919).

Torek et al. disclose a method for stripping a layer from a semiconductor wafer. The method comprises introducing ozone into a process chamber and activating a water spray for a first predetermined amount of time, thereby creating a water layer on a semiconductor wafer, wherein the water layer transport high concentrations of the ozone to the semiconductor wafer. The reference discloses controlling a thickness of the water layer. The reference discloses rotating the workpiece. The reference also discloses spraying a heated water and forming a boundary layer of a heated liquid. See col. 2, lines 7-57, col. 3, lines 20-26, col. 5, lines 38-45, col. 7, lines 19-65.

Torek et al. teach all limitation with the exception of delivering HF into the process chamber, and dissolving the

HF into DI water on the wafer surface and etching with dissolved HF as claimed.

DeGendt et al. disclose a method of cleaning a workpiece. The method comprises, providing a layer of heated liquid on the workpiece, the temperature, providing ozone, and removing contaminant, spinning the workpiece, and rinsing the workpiece. See paragraphs 78-83, 86, and claims 15, 39. The reference also teaches that dry etching of silicone and its compound is based on the reaction with fluorine. See paragraph 83. The reference also discloses the oxide removal step can be executed in a diluted HF-clean with or without additives such as HCL. See paragraph 36.

EP'177 as discussed supra in paper No. 041105 discloses a method for etching semiconductor wafer. The reference teaches rinsing the substrate with liquid jet to sweep away the HF solution, and spinning the substrate, and controlling the thickness of the layer of processing liquid. See the abstract, Fig. 1, page 2, lines 55-58, page 3, lines 11-page 4, line 24, and the claims.

It would have been obvious for one skilled in the art to use the HF taught by DeGendt et al. or EP'177 in the Torek et al. process to improve the etching process. This is because Torek et al. disclose that the ozone could be used to etch a semiconductor layer on, or strip another layer from the workpiece, see col. 4, lines 22-27, and DeGendt et al. disclose that HF can be used to remove

oxide from the wafer surface. This is also because it is known in the art to use the HF as etching solution to etch oxide film and as cleaning solution to remove polymer or photoresist from semiconductor surface.

Torek et al. in combination with DeGendt et al. or EP'177 as discussed supra do not teach reducing the thickness and the rate of etching as claimed.

Kenny et al. disclose a method of removing oxide or etching the surface of a wafer. The reference discloses that the etch rate and reducing the thickness depending on the temperature and the concentration of HF in the solution. It would have been obvious for one skilled in the art to adjust the concentration of HF solution of DeGendt

et al or EP'177 in the Torek et al. process to obtain the reduced thickness as claimed.

Response to Arguments

Applicant's argument with respect to DeGendt et al. do not teach thinning a wafer is unpersuasive, because removing the coating or photoresist from a wafer will inherently thinning a wafer. Applicant argues that claims 1, 13, and 38 describe method for thinning a silicon wafer. The chemical reactions involve the silicon material of the wafer itself, and not any organic coating on the wafer. Applicant's argument is unpersuasive because the process as claimed does not exclude removing the organic coating on the wafer.

Conclusion

4. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant

to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Zeinab E. EL-Arini whose telephone number is (571) 272-1301. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Barr can be reached on (571) 272-1414. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Zeinab Elarini

Zeinab E. EL-Arini
Primary Examiner
Art Unit 1746

ZEE
09/29/05